

华东师范大学期末试卷 (A)
2019 - 2020 学年第 2 学期

课程名称: _____存储技术基础_____

学生姓名: _____

学 号: _____

专 业: _____

年级/班级: _____

课程性质: 专业选修

一	二	三	四	五	六	总分	阅卷人签名

1. Multiple Choice (2.5 points for each choice, 75 points in total)

1) In addition to applications and databases, what are the other core elements of a data center infrastructure?

- A. JBOD, networks, and storage arrays
- B. Servers/operating systems, DAS, and NAS
- C. Servers/operating systems, networks, and storage arrays
- D. Servers/operating systems, SAN, and JBOD

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2) What is a characteristic of asynchronous remote replication?

- A. Only the last update is transmitted if there are multiple writes to the same location in the buffer
- B. Writes are committed to the target before being committed to the source
- C. Reads are always serviced from the target replica
- D. Distance between the two sites is restricted to less than 200 km

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3) What is the RAID 5 write penalty for random, small write I/Os?

- A. 1
- B. 2
- C. 4

D. 6

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4) Which iSCSI naming feature uses a 16-character hexadecimal string?

A. EUI

B. IQN

C. iSNS

D. ARP

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5) A department within an organization requires 200 GB of storage for their business application. The production LUN is RAID 1+0 protected and has a local and remote replica. The local replica is on a RAID 1 LUN and the remote replica is on a five-disk RAID 5 LUN.

If the cost per GB of storage is \$2.00, what is the chargeback cost to the department for application storage?

A. \$1050

B. \$1500

C. \$2100

D. \$2900

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6) Which iSCSI host connectivity option is recommended in a CPU-intensive application environment?

A. iSCSI HBA

B. NIC with software-based iSCSI initiator

C. TCP offload engine

D. Converged Network Adapter

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7) A finance department wants to secure its data while the data traverses over the FC SAN. Currently the SAN is also used by other departments in the organization.

Which implementation should be recommended to isolate other department traffic from the finance department traffic?

A. Virtual SAN

B. Virtual LAN

C. Fabric binding

D. Port binding

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8) Which remote replication solution has the highest bandwidth requirements?

A. Array-based synchronous

B. Array-based disk buffered

C. Host-based asynchronous LVM mirroring

D. Log shipping over IP networks

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9) In a Fibre Channel (FC) SAN, which protocol implementation is used?

A. SCSI over FC

B. SCSI over FCoE

C. FC over iSCSI

D. FC over SCSI

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10) A stripe depth of 32 KB has been assigned to a six-disk RAID 6 set. What is the stripe size?

A. 32KB

B. 128KB

C. 160 KB

D. 192 KB

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11) An application uses 20, 10 GB devices. A pointer-based full volume replica of the application is required every 6 hours. Each replica will be kept for 24 hours. The data

changes by 10% every 4 hours. How many replica devices are required?

- A. 20
- B. 60
- C. 80
- D. 120

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12) What does the area ID of the FC address identify?

- A. Group of ports within a switch
- B. An individual port within a fabric
- C. Location of the name server within the fabric
- D. Unique number provided to each switch in the fabric

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13) What does a block map contain in a file system snapshot?

- A. Address from which data is to be read when accessing the snapshot
- B. Original data when a write is issued to the target for the first time
- C. Blocks that have changed since the creation of the snapshot
- D. Blocks that have been modified in either the source or the target

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14) What is a characteristic of an active/passive storage array configuration?

- A. Read and write I/Os are performed only through the controller that manages the LUN
- B. Host can perform I/Os to its LUNs through any of the available controllers
- C. Read and write I/Os are performed only through active cache
- D. Passive array is used for backup; active array is used for production data

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15) What is a characteristic of asynchronous remote replication?

- A. Replica will be behind the source by at least the size of the buffer
- B. A near-zero RPO disaster recovery solution
- C. Write must be committed at the target before being acknowledged as complete

D. Deployed only for distances within 200 km between two sites

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16) What is a characteristic of triangle/multitarget replication?

- A. Failover can occur to either of the two remote sites
- B. Distance between all sites must be less than 125 km
- C. Bunker site must be in sync with the remote site at all times
- D. Only the production site is available during normal operations

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17) In what way does an integrated NAS solution differ from a Gateway NAS solution?

- A. Integrated NAS manages storage devices through NAS software. Gateway NAS relies on storage array management software to manage storage devices.
- B. Integrated NAS allows both file and block level access to the clients. Gateway NAS allows only block level access to the clients.
- C. Integrated NAS utilizes specialized operating systems. Gateway NAS utilizes generic operating systems.
- D. Integrated NAS uses Fibre Channel disks only. Gateway NAS uses both Fibre Channel and SATA disks.

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18) An application requires 4.0 TB of capacity. The application generates 2600 IOPS to disks during peak workloads. The vendor indicates that a 120 GB, 15K rpm drive is capable of performing a maximum of 170 IOPS.

How many disks are required to meet both capacity and performance requirements?

- A. 15
- B. 35
- C. 34
- D. 16

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19) What is the name of the drive sub-assembly which contains the platters and read/write

heads?

- A. ATA
- B. SATA
- C. HDA
- D. IDE

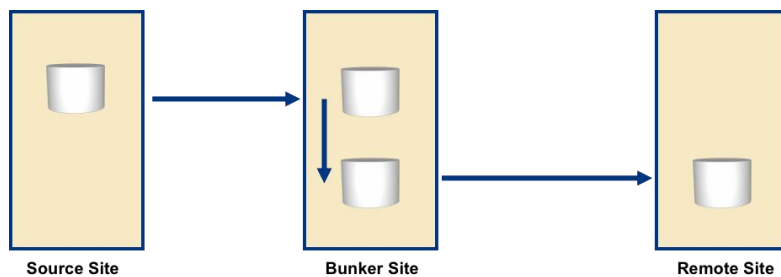
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20) Why would an iSCSI solution be implemented?

- A. All storage arrays supply GigE ports
- B. Block storage over IP is much faster than FC
- C. iSCSI HBAs are inexpensive
- D. Leverage existing IP network infrastructures

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21) Refer to Exhibit: Which type of replication is represented in the exhibit?



- A. Cascade/multihop, synchronous + disk buffered
- B. Cascade/multihop, synchronous + asynchronous
- C. Triangle/multitarget, synchronous + disk buffered
- D. Triangle/multitarget, synchronous + differential resync

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22) Which fabric service provides information about other logged in nodes after receiving a query from a node?

- A. Fabric controller
- B. Name server
- C. Management server

D. Fabric login server

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23) What is a key requirement that drives an organization to deploy a NAS solution?

A. Ability to handle large sequential workloads

B. Disaster recovery among different locations over IP

C. Data sharing between heterogeneous operating environments

D. Ability to handle large random workloads

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24) What is a role of the metadata service in object-based storage?

A. Stores both objects and object IDs

B. Maps object IDs to the file system namespace

C. Manages a set of disks on which the user data is stored

D. Stores data in the form of objects

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25) When reviewing the disaster recovery plan for two data centers, you find that:

-The copy of data at remote Site B will lag behind the production data at Site A by 5 minutes

-It will take 2 hours after an outage at Site A to shift production to Site B.

Three more hours will be needed to power up the servers, bring up the network, and redirect users to Site

What is the recovery time objective (RTO) of this plan?

A. 5 minutes

B. 2 hours

C. 5 hours

D. 5 hours 5 minutes

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26) A customer wants 24x7 availability for a business application that uses a file system.

Which operation ensures a consistent replica of the file system?

- A. Unmount the file system prior to the creation of the replica
- B. Stop the application prior to the creation of the replica
- C. Flush the file system buffers after creation of the replica
- D. Flush the file system buffers before creation of the replica

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27) What should be considered when determining the recovery point objective (RPO) in a log shipping remote replication?

- A. Frequency of log switching
- B. Size of the source database
- C. Size of the standby database
- D. Frequency of reading the database

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28) An ten-disk RAID 6 set has a stripe size of 192 KB. What is the stripe depth?

- A. 24 KB
- B. 32 KB
- C. 48 KB
- D. 64 KB

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29) If a disk drive's rotational speed is 7500 revolutions per minute, what is its average rotational latency?

- A. 4 milliseconds
- B. 5 milliseconds
- C. 6 milliseconds
- D. 8 milliseconds

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30) What is a characteristic of an FC-SW implementation?

- A. Provides a dedicated path between nodes
- B. Nodes arbitrate to gain control of the data path to transfer data

- C. Only one node can perform an I/O operation at a time
- D. Supports up to 126 nodes

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2. questions and answers (5 points for each question, 15 points in total)

- 1) What are the seven requirements of storage technology?
- 2) What is the difference between Write-through and Write-back cache?
- 3) How does data get stored in a CAS environment?

3. Discussion essays (10 points)

We have learned several networked storage architectures in this semester. What kind of scenarios are they suitable for?

(Any reasonable answer is allowed.)